SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES

(A University established by an act of A.P. State legislature)

TIRUMALA TIRUPATI DEVASTHANAMS, TIRUPATI - 517501

CLINICIAN'S REFERENCE MANUAL

DEPARTMENT OF PATHOLOGY

What is this manual about?

This manual is designed to provide an overview of the services offered by the Department of Pathology and serve as a quick reference guide for all users.

Laboratory Management is committed to ensure stringent adherence to quality in all laboratory procedures that meet requirements of internal and external quality assessment tests and in accordance with requirements of the ISO 15189

Document Control

Electronic version of this manual is available on SVIMS website. (Access at www.svimstpt.ap.nic.in

Location

The Department of Pathology located in Room No.19, SVIMS old building opposite to the department of Radiology.

Contact Us

Postal Address:
Department of Pathology
Room No.19,
Opposite to Dept. of Radiology
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Getting Started

LOCATION OF THE DEPARTMENT:

A. Ground floor of old SVIMS hospital building:
    1. Cytopathology, Clinical Pathology, Frozen, Squash and reception for histology specimen collection.
B. 2nd floor of Sri Padmavathi medical college for women building:
    1. Histopathology.

DEPARTMENTAL WORKING HOURS: The Department is open 24x7 on 365 days of a year

DEPARTMENT FACULTY & CONTACT NUMBERS:

		CONTACT NUMBERS
SECTIONS/LABS	Office	0877 - 2287777- 2231
	Lab Testing/Reports Enquiry	0877 - 2287777- 2231
	Cytology	0877 - 2287777- 2404
	Haematology/Clinical Pathology	0877 - 2287777- 2274
	Histopathology	0877 - 2287777- 2236
Faculty	Dr.N.Rukmangadha, Professor & HOD	0877 - 2287777- 2248

SERVICES OFFERED & CHARGES

S. No	CODE	NAME OF INVESTIGATION	OP/OI Amount in INR	IP Amount in INR
1	HIS01	BIOPSY (1 BLOCK)	250	310
2	HIS02	BIOPSY (2 - 5 BLOCK)	450	560
3	HIS03	BIOPSY (6 - 10 BLOCKS)	600	750
4	HIS04	BIOPSY (MORE THAN 10 BLOCKS)	800	1000
5	HIS05	BIOPSY (MORE THAN 20 BLOCKS)	1000	1250
6	HIS06	BIOPSY (MORE THAN 30 BLOCKS)	1500	1875
7	HIS07	BIOPSY (MORE THAN 40 BLOCKS)	2000	2500
8	HIS09	CROSTAT SECTION AND SQUASH	1000	1250
9	HIS11	CT GUIDED BIOPSY (1 BLOCK)	250	310
10	HIS12	DUPLICATE REPORT (EACH)	45	60
11	HIS13	DUPLICATE SLIDES (EACH)	150	190
12	HIS14	ENDOSCOPIC BITS	500	625
13	HIS15	FOETAL AUTOPSY FOR DIAGNOSIS	1500	1875
14	HIS17	IMMUNOHISTOCHEMISTRY (IHC)	750	940
15	HIS19	IMMUNOCYTOCHEMISTRY (ICC)	750	940
16	HIS20	KIDNEY BIOPSY (WITH IF) PACKAGE	2500	3125
17	HIS21	KIDNEY NEEDLE BIOPSY (WITH OUT IF) PACKAGE	500	625
18	HIS22	LIVER BIOPSY	500	625
19	HIS23	LYMPH NODE BIOPSY	500	625
20	HIS24	PARAFFIN BLOCK (EACH)	50	60
21	HIS27	SECOND OPINION (REVIEW BIOPSY)	500	625
22	HIS28	TREPHINE BIOPSY (BONE MARROW)	650	810
23	HIS29	TRUS BIOPSY (2 -6 BLOCKS)	600	750
24	HIS30	ULTRA SOUND GUIDED BIOPSY (1 BLOCK)	250	310
25	HIS31	IHC PACKAGE FOR CNS TUMOURS	2500	3125
26	HIS32	IHC (2-5 MARKERS)	3750	4690
27	HIS33	IHC (6-10 MARKERS)	7500	9375
28	HIS34	IHC (11-15 MARKERS)	11250	14065
29	HIS35	IHC (2-5 MARKERS PANEL)	3000	3750
30	HIS36	IHC (6-10 MARKERS PANEL)	5000	6250
31	HIS37	IHC (11-15 MARKERS PANEL)	9000	11250

S. No	CODE	NAME OF INVESTIGATION	OP/OI Amount in INR	IP Amount in INR
1	CYP01	BUCCAL SMEARS FOR SEX CHROMATIN	140	175
2	CYP02	FLUID CYTOLOGY ASCITIC FLUID	350	440
3	CYP03	FLUID CYTOLOGY BRONCHIAL WASHING LAVAGE	350	440
4	CYP04	FLUID CYTOLOGY CSF	350	440
5	CYP05	FLUID CYTOLOGY CYSTIC FLUID	350	440
6	CYP06	FLUID CYTOLOGY PERICARDIAL FLUID	350	440
7	CYP07	FLUID CYTOLOGY PLEURAL FLUID	350	440
8	CYP08	FLUID CYTOLOGY PUS	350	440
9	CYP09	FLUID CYTOLOGY SPUTUM	350	440
10	CYP10	FLUID CYTOLOGY SYNOVIAL FLUID	350	440
11	CYP11	FLUID CYTOLOGY URINE	350	440
12	CYP12	FNAC BONE	500	625
13	CYP13	FNAC BREAST	500	625
14	CYP14	FNAC CT/GUIDED	500	625
15	CYP15	FNAC FEMALE GENITAL ORGANS	500	625
16	CYP16	FNAC FOR CYTOLOGY	500	625
17	CYP17	FNAC HEAD AND NECK, SALIVARY GLANDS	500	625
18	CYP18	FNAC KIDNEY AND ADRENAL AND RETROPERITONEUM	500	625
19	CYP19	FNAC LIVER AND SPLEEN	500	625
20	CYP20	FNAC LUNG, CHEST WALL AND PLEURA	500	625
21	CYP21	FNAC LYMPH NODE	500	625
22	CYP22	FNAC MALE GENITAL ORGANS	500	625
23	CYP23	FNAC MEDIA STINUM	500	625
24	CYP24	FNAC PANCREAS AND BILIARY TRACT AND GIT TRACT	500	625
25	CYP25	FNAC SKIN	500	625
26	CYP26	FNAC SOFT TISSUE	500	625
27	CYP27	FNAC THYROID	500	625
28	CYP28	FNAC U/S GUIDED	500	625
29	CYP29	NIPPLE DISCHARGE	140	175
30	CYP30	PAP SMEARS	275	340
31	CYP31	SECOND OPINION(REVIEW OPINION) CYTOLOGY	500	625
32	CYP32	FLUID CYTOLOGY - PERITONIAL	350	440
33	CYP33	FLUID FOR CYTOLOGY	350	440

S. No	CODE	NAME OF INVESTIGATION	OP/OI Amount in INR	IP Amount in INR
1	HAE01	ABSOLUTE EOSINOPHIL COUNT(AEC)	100	125
2	HAE02	ABSOLUTE LYMPHOCYTE COUNT (ALC)	100	125
3	HAE03	ABSOLUTE NEUTROPHIL COUNT(ANC)	100	125
4	HAE04	BONE MARROW BIOPSY (PROCEDURE CHARGES)	1250	1560
5	HAE05	APTT BT CT PT	500	625
6	HAE06	APTT/PTTK	250	310
7	HAE07	BLEEDING TIME(IV S METHOD)	100	125
8	HAE08	BONE MARROW ASPIRATION AND EXAMINATION	430	540
9	HAE09	CLOTLYSIS	110	140
10	HAE10	CLOT RETRACTION	110	140
11	HAE11	CLOTTING TIME (LEE AND WHITE)	100	125
12	HAE12	COMPLETE HAEMOGRAM	500	625
13	HAE13	ESR	70	90
14	HAE14	FIBRINOGEN ASSAY	310	385
15	HAE15	GIEMSA-STAIN	100	125
16	HAE16	HAEMOGLOBIN	50	60
17	HAE17	HAM S TEST	250	310
18	HAE18	HB TC DC	250	310
19	HAE19	HB TC DC ESR	270	335
20	HAE20	HB TC DC PLATELET COUNT	305	380
21	HAE21	L.E.CELL PHENOMENON	175	220
22	HAE22	MALARIAL PARASITES(MP)(QBC METHOD)	175	220
23	HAE23	MCH	60	75
24	HAE24	MCHC	60	75
25	HAE25	MCV	60	75
26	HAE26	MHC (HAEMATOLOGY)	150	190
27	HAE27	MICRO FILARIA(MF)(QBC METHOD)	175	220
28	HAE28	MYLO PEROXIDASE STAIN (MPO)	250	310
29	HAE29	OSMOTIC FRAGILITY	310	390
30	HAE30	PARTIAL THROMBOPLASTIN TIME(PTT)	250	310
31	HAE31	PAS-STAIN	250	310
32	HAE32	PCV	75	95
33	HAE33	PERIPHERAL SMEAR	345	430
34	HAE34	PERLS-STAIN(IRON STAIN)	250	310
35	HAE35	PLATELET COUNT	100	125
36	HAE36	PROTHROMBIN TIME WITH INR	250	310
37	HAE37	RBC COUNT	90	110
38	HAE38	RETICULOCYTE COUNT	90	110
39	HAE39	SICKLE CELL TEST	150	190
40	HAE40	THROMBIN TIME	260	325
41	HAE41	WBC DIFFERENTIAL COUNT - (DC)	70	90
42	HAE42	WBC (TC AND DC)	140	175
43	HAE43	WBC TOTAL COUNT - (TC)	70	90

S. No	CODE	NAME OF INVESTIGATION	OP/OI Amount in INR	IP Amount in INR
44	HAE44	APTT/PTTK (STAT TESTING)	325	325
45	HAE45	HAEMOGLOBIN (STAT TESTING)	65	65
46	HAE46	MALARIAL PARASITES-(MP) (QBC METHOD) (STAT TESTING)	230	230
47	HAE47	PCV (STAT TESTING)	100	100
48	HAE48	PLATELET COUNT (STAT TESTING)	130	130
49	HAE49	PROTHROMBIN TIME WITH INR (STAT TESTING)	325	325
50	HAE50	C.S.F. CELL COUNT (STAT TESTING)	195	195
51	HAE51	URINE FOR KETONE BODIES (STAT TESTNG)	80	80

S. NO	CODE	NAME OF INVESTIGATION	OP/OI Amount in INR	IP Amount in INR
1	CLP01	ANY OTHER BODY FLUID FOR CELL COUNT	150	190
2	CLP02	ASCITIC FLUID FOR CELL COUNT	150	190
3	CLP03	C.S.F CELL COUNT	150	190
4	CLP04	MHC (CLINICAL PATHOLOGY)	80	100
5	CLP05	P.D. FLUID FOR CELL COUNT	150	190
6	CLP06	PERICARDIAL FLUID FOR CELL COUNT	150	190
7	CLP07	PERITONIAL FLUID FOR CELL COUNT	150	190
8	CLP08	PLEURAL FLUID FOR CELL COUNT	150	190
9	CLP09	SEMEN ANALYSIS	500	625
10	CLP10	STOOL-OCCULT BLOOD	100	125
11	CLP11	SYNOVIAL FLUID FOR CELL COUNT	150	190
12	CLP12	URINE FOR ALBUMIN	80	100
13	CLP13	URINE FOR BENZIDINE TEST	60	75
14	CLP14	URINE FOR BILE PIGMENTS	60	75
15	CLP15	URINE FOR BILE SALTS	60	75
16	CLP16	URINE FOR CHYLE	60	75
17	CLP17	URINE FOR CHYLOMICRONS	60	75
18	CLP18	URINE FOR EOSINOPHILS(EARLY MORNIG SAMPLE)	150	190
19	CLP19	URINE FOR KETONE BODIES	60	75
20	CLP20	URINE FOR MICROSCOPIC EXAMINATION	60	75
21	CLP21	URINE FOR REACTION(PH)	80	100
22	CLP22	URINE FOR ROUTINE AND MICROSCOPY	150	190
23	CLP23	URINE FOR ROUTINE EXAMINATION	150	190
24	CLP24	URINE FOR SPECIFIC GRAVITY	80	100
25	CLP25	URINE FOR SUGAR	80	100
26	CLP26	URINE FOR UROBILINOGEN	60	75
27	CLP27	URINE PREGNANCY TEST	80	80

SERVICES TURN AROUND TIME

	Test	TURN AROUND TIME (TAT)			
		Waiting time	Time to Prepare the test	Time to Prepare and Release the report	Total TAT
1.	Haemoglobin	1hr	1hr	1hr	3 hrs
2.	PCV	1hr	1hr	1hr	3 hrs
3.	RBC count	1hr	1hr	1hr	3 hrs
4.	Platelet Count	1hr	1hr	1hr	3 hrs
5.	ESR	1hr	1hr	1hr	3hrs
6.	TC	1hr	1hr	1hr	3 hrs
7.	DC	1hr	1hr	1hr	3 hrs
8.	Peripheral Smear	1hr	1hr	1hr	3 hrs
9.	Absolute Eosinophil Count	1hr	1hr	1hr	3 hrs
10.	Malarial Parasites	1hr	1hr	1hr	3hrs
11.	Microfilaria	1hr	1hr	1hr	3hrs
12.	L.E Cell Phenomenon	1hr	22hr	1hr	24hrs
13.	MCV	1hr	1hr	1hr	3 hrs
14.	MCH	1hr	1hr	1hr	3 hrs
15.	MCHC	1hr	1hr	1hr	3 hrs
16.	Reticulocyte Count	1hr	1hr	1hr	3 hrs
17.	Bleeding Time	1hr	1hr	1hr	3 hrs
18.	Clotting Time	1hr	1hr	1hr	3 hrs
19.	Prothrombin time	1hr	2hrs	1hr	4 hrs
20.	APTT	1hr	2hrs	1hr	4hrs
21.	Complete Haemogram	1hr	3hrs	20hr	24hrs
22.	Bone Marrow Aspiration and Examination	1hr	1 day	2days	3days
23.	Urine – Albumin	1hr	1hr	1hr	3 hrs
24.	Urine – Sugar	1hr	1hr	1hr	3 hrs
25.	Urine Specific Gravity	1hr	1hr	1hr	3 hrs
26.	Urine – Reaction (PH)	1hr	1hr	1hr	3 hrs
27.	Urine – Microscopic Examination	1hr	1hr	1hr	3 hrs
28.	Urine – Ketone Bodies	1hr	1hr	1hr	3 hrs
29.	Urine-Bile Salts & Bile Pigments	1hr	1hr	1hr	3 hrs
30.	Urobilinogen	1hr	1hr	1hr	3 hrs
31.	Urine Chyle	1hr	1hr	1hr	3 hrs
32.	Benzidine Test	1hr	1hr	1hr	3 hrs
33.	Semen Analysis	1hr	1hr	1hr	3 hrs
34.	Stool For Occult Blood	1hr	1hr	1hr	3 hrs
35.	Urine For Routine Examination	1hr	1hr	1hr	3 hrs

36.	Any Fluid Examination	1hr	1hr	1hr	3 hrs
37.	Urine For Myo globin	1hr	1hr	1hr	3 hrs
38.	Urine For Haemoglobin	1hr	1hr	1hr	3 hrs

General instructions for all Tests/Samples:

a. **Outpatients:**

Sample Collection and performance of the test:

1. The requesting physician writes all the tests required in the case sheet of the patient and also generates a laboratory test requisition slips.
2. The Patient/ attendant pays the user charges for the prescribed tests at the billing counter as per the requisition slips.
3. The billing clerk collects the user charges for the prescribed test and hands over the paid bill receipt.
4. For clinical pathology investigations the patient visits the collection centre where a bar code is generated and pasted on the vaccutainers and later blood samples are collected. All other necessary details are also pasted on the collection container. For samples other than clinical pathology the patient visits the department. Details of sample collection are given in the manual.
5. The samples will be received at the respective reception counters. All details of the patient, requesting form with the reference doctor name, type of sample are entered in the flow register kept at the reception counter. The patient sample acceptance is also verified in the hospital information system.

Any sample with incorrect or incomplete details is rejected:

6. In case of crowd at the reception counter patients are requested to wait in the waiting area of the department till their turn. Patient's sample collection is done strictly on the basis of "first come first serve basis".
7. The technician at the reception counter verifies all the details of patient and sample, and if found satisfactory accepts and delivers the sample to the working station. Patients are informed about the time and day for collecting the test reports for histopathology, cytology and bone marrow samples.
8. In the lab the tests are performed following standard guidelines and reports are generated. All reports are verified, signed with date by authorized incharge pathologist of the specific section.
9. Later reports are entered in the respective entry registers and handed over to the personal assistant of the lab to enter the reports in the hospital information system.

10. Reports are also dispatched to the medical records department of the hospital for filing them in the patient record.
11. Patients/ relatives can collect the report from the reception area of the laboratory on the said date and time. They may also collect the reports from the MRD section of hospital. The referral doctor can see the reports on PC in the OPD.

b. Inpatient:

Sample Collection and performance of test:

1. The requesting physician writes all the tests required in the case sheet of the patient and also generates laboratory test requisition forms duly signed and the same is given to the ward nurse.
2. The Patient/ attendant are informed about the investigations requested who in turn pays the user charges for the prescribed tests at the billing counter.
3. The billing clerk collects the user charges for the prescribed test as per requisition slips and hands over the paid receipts.
4. The Ward nurse collects the patient's sample in vaccutainers and gives a bar code for identification.
5. The ward attendant carries the sample along with the requisition form with bar code from the inpatient ward to the Pathology lab.
6. Technician at the reception counter receives the samples, records the name of the patient, age, sex, sample type and patients sample bar code number in the inpatient flow register.
7. The attender will be informed about the time and day for collecting the test reports.
8. In the lab the tests are performed following standard guidelines and reports are generated. All reports are verified, signed with date by authorized incharge pathologist of the specific section.
9. Later reports are entered in the respective entry registers and handed over to the personal assistant of the lab to enter the reports in the hospital information system.
10. The reports are dispatched to the concerned ward and at the same time they are made available on the HIMS which can be seen by the concerned doctor ward nurse.
11. **Site of Report Collection:**

1. All reports are available online in the hospital information system, HIMS.
2. All Reports (Inpatient & Outpatient) will be despatched and made available at respective wards and MRD section (for OPD Patient).

3. Outpatient investigation reports are handed over to the attendants/ patients at the report issue counter-B of Pathology Department.

Samples hand delivered by clients, hospital staff or patient attendants to the laboratory:

- The individuals carrying the samples should first visit the sample receiption counter (RoomNo.19 SVIMS Old Building: Counter A, Histopathology and Cytology. Counter- C Haematology and Clinical Pathology)
- The test request form and suitability/quality of samples will be checked by laboratory staff and a provisional bill with the amount to be paid towards testing will be issued to the individual.
- The provisional bill amount has to be paid at the billing counter {Counter No. 3, Padmavathi OPD Bloock) after which a printed invoice will be issued to the individual.
- The printed invoice has to be produced immediately at the sample receipt counter for verification by laboratory staff.
- Physicians, clients or their representatives can opt to collect the report (hard copy) personally at the report issuing counter (Counter B, RoomNo.19 SVIMS Old Building/ Kendram-4 Padmavathi OPD Block).

Samples transported by commercial courier services to the laboratory:

- The samples will be received by the receptionist in the histopathology, cytology and haematology & clinical pathology counters respectively.

Sample Receipt timings

Sample type	Collection centre	Location	Timings
OPD clinical Pathology samples	OPD Collection centre	Room no.11 in Padmavathi OPD block	7 am - 5 pm
	SPMCW Hospital	Ground floor next to registration counter	8 am - 1pm
	SVIMS clinic	SVIMS clinic building, sample collection centre no 17	7 am- 1pm
Clinical Pathology	Samples from IP patients	Reception in the Department of Pathology in SVIMS, Room no 19	24X7
Histopathology	All samples from SVIMS, SPMCWH & outside samples.	Reception in the Department of Pathology in SVIMS, Room no 19	Monday-Saturday-8am to 5pm. Sundays & Holidays-9am to 1pm
Cytology samples	All samples from SVIMS, SPMCWH & outside samples.	Reception in the Department of Pathology in SVIMS, Room no 19	8am-5pm Sundays and Holidays 9am to 1pm

Details of clinical samples to be sent for each test, type of container and the minimum quantity of sample to be sent for each test are tabulated on the following page (Sample Acceptance Criteria).

SAMPLE ACCEPTANCE CRITERIA

TEST	SPECIMEN	TUBE/ CONTAINER	Minimum Quantity	REMARKS
CLINICAL PATHOLOGY				
Hemoglobin estimation (Hb%)	Blood	EDTA Bulb Lavender Top	• 2 ML	• Mix gently by inverting the tube, 4-5 times • Avoid IV lines • Storage & transport at controlled temperature
Packed cell volume (PCV)				
Total and differential leucocyte count				
Platelet count				
Reticulocyte count				
Absolute Eosinophil Count				
Cancer follow up				
Haemogram (CBP + PS + RC count + ESR)	Blood	EDTA Bulb Lavender Top + Black Top	• 2 ML	• Mix gently by inverting the tube, 4-5 times • Avoid IV lines • Storage & transport at controlled temperature
Erythrocyte Sedimentation rate (ESR)	Blood	EDTA bulb Black Top	• 2 ML	• Mix gently by inverting the tube, 4-5 times • Avoid IV lines • Storage & transport at controlled temperature
Peripheral smear	Blood	Direct smears on glass slides/ EDTA Bulb Lavender Top	2 ML	Slides should be transported in slide carrier
Malarial Parasite				**MARK AS URGENT**
Microfilaria				
Urine albumin + sugar	Urine	Clean plastic container	• 10 ML	• Fresh sample to be sent • Storage & transport at controlled temperature
Urine sugar + Ketone bodies				
Urine microscopy				
Urine metachromatic				

granules Complete urine study				
Fluid cell count	Body fluids (Pleural, CSF, Peritoneal, Synovial, Pericardial, others)	Clean plastic container	• 10 ML	• Fresh sample to be sent • Storage & transport at controlled temperature. • **CSF sample – Minimum 1ml**
Semen Analysis	Semen	Clean plastic container	•	• To be collected after 3-5 days of abstinence • Collect the entire specimen into a clear, sterile, plastic container • Obtain specimen by masturbation or withdrawal method. • Do not use a condom or any form of lubricant. • Ideally to be collected in the hospital. If not, transport the sample to lab within half an hour from the time of collection. • **Sample will be received only upto 1pm**
Stool for occult blood	Stool	Clean plastic container	• 10gm	• This test ideally requires 3 separate specimens collected on 3 separate days for a complete investigation done within a continuous 5 day period • If a doctor requests only 1 or 2 specimens this can also be performed. • It is recommended that the patient be placed on a high fibre diet two days before and during the test period. • Patients on iron tablets can continue with this therapy before and during the test

				period. **CONTRAINDICATIONS FOR COLLECTION ARE**: · During Menstruation · Bleeding Haemorrhoids · Constipation/bleeding · Urinary Bleeding Avoid alcohol, indomethacin, reserpine, phenylbutazone, & corticosteroids as these may cause gastrointestinal irritation and subsequent bleeding in some patients. Avoid aspirin or anti-inflammatory drugs for 7 days prior and cease rectal medicines and tonics 2 days prior to test. • Specimen: Fresh sample of faeces
SPECIAL HEMATOLOGY				
Bone marrow aspiration	Bone marrow	Smear prepared & air dried (6 No.s) Peripheral smears are also collected (6 No.s)	•	• Prior appointment needed for procedures • Procedures done by pathology residents/ faculty in pathology procedure room (Room No19) • For immovable patients procedures are done at bedside on request • Timings for elective procedures: 3:00 PM to 4:00 PM (Mon to Sat) • Emergency out of hour procedures are done round the clock at bedside (Please contact duty resident/ faculty)
Bone marrow biopsy	Bone marrow biopsy	2-3 cm biopsy immersed in B5 fixative after making imprints on glass slides (6 No.s)		
Cytochemical stains	Bone marrow aspirate/ peripheral smear	No.s depend on the number of stains required (Minimum 2/ stain)	• 2Nos	• Fresh smears required for MPX, SBB, NSE, LAP Score, Acid Phosphatase, TRAP • Slides to be transported in slide carrier.

Sicke cell preparation	Blood	EDTA Bulb/ Lavender Top	2ML	
G - 6PD deficiency screening	Blood	EDTA Bulb/ Lavender Top (Minimum 3 tubes = 6ML)	2ML	Prior appointment needed
Osmotic fragility test	Blood	EDTA bulb + Heparin tube One Green Top + one Lavender Top	2ML	Prior appointment needed
PNH Testing	Blood Urine (for hemosiderin)	• EDTA bulb / Lavender Top for blood • Urine in clean plastic container	• Blood 2ML, • Urine 10L	• Prior appointment needed • Urine sample: Morning first void sample
LE cell	Blood	Heparin tube/ Green Top	Minimum 4 tubes = 8ML	Prior appointment needed
Fetal Hemoglobin	Blood	EDTA bulb / Lavender Top	Minimum 4 tubes = 8ML	
Coagulation Studies • PT, APTT, TT, Fibrinogen,	Blood	Blue Top	1.8ML	• Tube must be filled to line/ exact volume required. • Mix well • Specimen should reach the lab within 4hrs of collection. • Refrigerate • If delay in testing expected - separate plasma and freeze immediately.

CYTOLOGY				
Fluid cytology	CSF/Pleural/ Peritoneal/ Synovial/ Pericardial & others	Clean plastic container	2ML	• Fresh sample to be sent • Storage & transport at controlled temperature
Cervical PAP smears	Cytofixative tube with brush	Containers with cytofixative	(Minimum 2 No.s)	• Containers can be collected from cytology section (Room no. 19, SVIMS Old Building). • Prepared smears should be immediately immersed in isopropyl alcohol.
	Alcohol fixed smears on glass slides	Used Uristix container with isopropyl alcohol		
Fine Needle Aspiration Cytology	Air dried smears (Minimum 2 No.s) Alcohol fixed smears(Minimum 2 Nos)	Used Uristix container with isopropyl alcohol for alcohol fixed smears Material for CELL BLOCK to be sent in 10% Neutral buffered formalin (10-20 times volume of sample)	Minimum 3No.s	• Procedures done by pathology residents/ faculty in pathology procedure room (Room No. 19) • For immovable patients procedures are done at bedside on request • Timings for elective procedures: 9.00 PM to 1.00 PM (Mon to Sat) • Emergency out of hour procedures are done round the clock at bedside (Please contact duty resident/ faculty) • Guided procedures done by Radiology residents/ faculty • Air dried smears to be sent in slide carriers
Bronchial brushings	Alcohol fixed smears on glass slides (Minimum 2 No.s)	Used Uristix container with isopropyl alcohol	Alcohol fixed smears on glass slides (Minimum 2 No.s)	
Bronchial washings	Washings	Clean Plastic containers	2ML	• Fresh sample to be sent • Storage & transport at controlled temperature

Sputum cytology	Sputum: 3 consecutive days	Clean Plastic containers	2ML	• Early morning sample • Coughed out sample • Avoid contamination with saliva • Fresh sample to be sent • Storage & transport at controlled temperature
Urine cytology	Urine: 3 consecutive days	Clean Plastic containers	2ML	• Morning sample • Storage & transport at controlled temperature
Small Biopsies	Tissue	Appropriate size leak proof plastic container with 10% Neutral buffered formalin (10-20 times volume of sample)		
Medium & Large specimens	Tissue	Appropriate size leak proof plastic container Preferably sent fresh / in 10% Neutral buffered formalin (10 times volume of sample)	•	• If the specimen is being sent fresh – transportation should be done immediately from the OT • If delay is unavoidable store in refrigerator (2-8^{o}C). Avoid drying of specimen.
Frozen Section/ Squash	Tissue	Plastic container with normal saline		
Renal/ Skin biopsy for Immunofluoresence (IF)	Tissue	• One piece in 10% Neutral buffered formalin (10-20 times volume of sample) • One piece in normal saline	•	• IF specimen to be transported without delay • If delay is unavoidable store in refrigerator (2-8^{o}C). Avoid drying of specimen.

Liver biopsy	Tissue	• Plastic container with 10% Neutral buffered formalin (10-20 times volume of sample) • If glycogen storage disease is suspected, biopsy to be sent in alcohol (70% Isopropyl alcohol)		

SAMPLE REJECTION CRITERIA
Events outside the laboratory: Haematology and Clinical Pathology

Code no.	Description
1	**ERRORS IN REQUISITION FORMS**
a	Missing/incomplete data on the request - no diagnosis, no clinician's/ requesting personnel signature
b	Bar code is not legible due to poor quality of print out
c	Requisition forms with hand written test parameters which are not confirmed
d	Sample sent without requisition form
e	Requisition form received without sample
f	Sample collection not confirmed and test not displayed in lab system for the patient
2	**SAMPLE LABELLING ERRORS**
a	Incorrect patient identification -improper labelling- mismatch
b	Labels not properly pasted on sample container - falling off and replaced by worker transporting the samples
3	**SAMPLE ERRORS**
a	Sample type mismatch- urine sample received for CSF request, etc
b	Specimen insufficient
c	Wrong anticoagulant/ incorrect anticoagulant: sample ratio
d	Non fasting sample sent for tests which require fasting- time of sample collection is wrong
e	Samples intended for other labs received - sample mix up
f	Delayed/improper transportation of sample

Events within the laboratory:

Code no.	Description
4	Upon separation serum sample is found to be haemolysed - improper sample collection, transportation, centrifugation
5	Sample mix up while transferring sample from collection tube to centrifuge tube and from centrifuge tube to sample cups for analyser.
6	Sample loss due to tube breakage in centrifuge and or spillage

Histo & Cytopathology:

1. Miss match labelling samples.
2. Without labelling samples.
3. Without request forms.
4. Autolysed specimen.
5. Specimen sent in normal saline / spirit.

6. Dried pap smears
7. Autolysed fluid / samples sent in formalin.

Rejection criteria for Frozen and Squash:
1. Receiving time more than 30minutes.

2. Specimen received in formalin.

Rejection criteria for Review Biopsy and Review Cytology:
1. Without clinical details.

2. Miss match between forms and slides.

Release of laboratory reports:

Analysis of samples:

Procedures and methods that are up to date with current practices according to department SOP manual will be used.

All procedures are performed in accordance with strict quality control by authorized Personnel.

The tests are periodically evaluated using internal quality control as well as external quality assurance.

Release of laboratory reports

Hard copies of reports if required can be collected personally by clients/patients at the report issue counter (Counter B Room No.19, SVIMS Old building/ Kendram – 4, Padmavathi OPD Block).

Reports will NOT be sent bv post or courier services or by email.

Reports over telephone are usually avoided except for emergency situations/under special circumstances. In such situations the report will be conveyed only to treating physician in charge of the given case.

All critical values will be informed to the concerned wards immediately.

Retention of specimens after reporting:

1. Blood, urine and body fluids - clinical pathology samples are discarded within 24hrs,
2. Cytology fluid samples are discarded within 48 hrs.
3. Biopsy specimens are discarded after 1 month.
4. Bone marrow aspirate will be stored for a period of 7days.

PROCEDURES FOR SAMPTE COLLECTION:

PHLEBOTOMY

Done under strict aseptic precautions.

Method: A tourniquet is applied above the elbow joint to make the median cubital vein (usual site for collection) prominent. Alcohol soaked swabs are used to clean the ante-cubital fossa, after which required quantity of blood is withdrawn with the syringe. Once the blood is drawn into the syringe, it should be emptied in to the sample container, forceful emptying of the syringe should be avoided as it might cause hemolysis. Only Venipuncture blood should be collected. Collection of blood from intravenous lines, central lines should be avoided.

Collection of urine:

Sterile containers are provided to the patient. Urine specimen should be collected as an early morning mid-stream clean catch urine in a sterilized container and sent to lab immediately.

Instructions: Patients are instructed to collect a minimum of 15 ml of a random sample of urine in a clean dry container (preferably collected near the laboratory).

Instruct patients to void directly into the container and while collecting, allow the first portion of urine to be discarded. Use fresh, well mixed, uncentrifuged urine as specimen for the test Process the samples within 4 hours of sample collection. If delay is anticipated, store the sample at 2- 8 degree C. Insufficient sample and samples without an ID number or contaminated Samples will be rejected.

Body fluids:

Cerebrospinal fluid: Lumbar puncture/cisternal puncture procedure to be performed under aseptic precautions using universal safety precautions. Sample should be collected in sterile tubes. Glass tubes to be avoided since cell adhesion to the glass affects the cell count and differential count.

Typically, 3-5 ml of CSF is collected

Tube 1: Chemistry (glucose and protein) and serology.

Tube 2: Microbiology (Gram's staining, bacterial culture, and sensitivity).

Tube 3: Haematology (Total cell count and differential count).

Tube 4: Cytology, special studies.

0.5 – 1ml of CSF is sufficient for differential leukocyte count and cytological examination

CSF samples should be transported immediately to the laboratory and examined within 1 hour after collection to avoid risk of cellular degradation.

Ascitic Fluid:

Abdominal paracentesis/ascitic tap procedure to be performed under aseptic precautions using universal safety precautions. Peritoneal washings sample generally sent for cytological examination only. Diagnostic peritoneal lavage [DPL] – no longer recommended. Sterile plain tubes for gross examination. Glass tubes to be avoided since cell adhesion to the glass affects the cell count and differential count. For diagnostic studies, pleural fluid is collected in heparinised tubes to prevent clotting. For cell counts and microscopic examination sample is collected using EDTA anticoagulant.
Fresh specimen can be reported in 1 - 2 hours. Samples for cytology may be stored up to 48 hrs in refrigerator.

Pleural fluid:

Thoracocenthesis / pleural tap procedure to be performed under aseptic precautions using universal safety precautions. Sterile plain tubes for gross examination. Glass tubes to be avoided since cell adhesion to the glass affects the cell count and differential count. For diagnostic studies, pleural fluid is collected in heparinised tubes to prevent clotting. For cell counts and microscopic examination sample is collected using EDTA anticoagulant. Fresh specimen can be reported in 1 -2 hours. Samples for cytology may be stored up to 48 hrs in refrigerator.

Synovial Fluid:

Collection: Arthrocentesis/synovial tap procedure to be performed under aseptic precautions using universal safety precautions. Sterile plain tubes for gross examination. Glass tubes to be avoided since cell adhesion to the glass affects the cell count and differential count. For diagnostic studies,synovial fluid is collected in heparinised tubes to prevent clotting. For cell counts and microscopic examination sample is collected using EDTA anticoagulant. Fresh specimen can be reported in 1 -2 hours. Samples for cytology may be stored up to 48 hrs in refrigerator.

Semen Analysis:

Collection: The sample is obtained by masturbation after about 3 days of sexual abstinence and brought to the laboratory within half an hour of collection. The entire ejaculate should be collected in a dry, sterile, and leak proof wide-mouthed plastic container.

Bone Marrow Aspiration and Biopsy Procedure:

Site - Aspiration and biopsy from Posterior Superior Iliac Spine in adults. From upper end of tibia in children below 5 years. Aspiration from sternum not routinely done.

Reagents Required: 2%xylocaine, Betadine, Surgical spirit, methanol, Leishman stain, Giemsa stain, Perl's stain & Formalin.

Materials Required: Sponge holder, sterile gauze swabs, sterile latex gloves, latex gloves unsterile, Needles 22 and 26 gauge, Disposable plastic sterile syringe 5ml and 10 ml, Sterile dressing sheet, bandage, scissors, adhesive tape & microscope slides.

Patient Preparation:

Check for the indications for performing the bone marrow procedure are present according to the guidelines. Check for contraindications for performing BMA - local site infection. Reassure the patient, describe the procedure in brief and take INFORMED CONSENT. Record pre procedure BP and pulse. A test dose of 2% lignocaine is given on the forearm of the patient before the procedure and note for any adverse reaction. Check for all the reagents and materials availability before performing the BMA.

Procedure:

- For aspiration at posterior superior iliac spine place the patient on one side with back towards the doctor, knees and hips flexed and the knees drawn towards the chest.
- Remove the clothes from the intended site and with non-sterile gloves select the site at PSIS, the most prominent bony part at the back. If required make a mark with pen.
- Wear sterile gloves and first swipe the area in circular motion from centre to periphery with Betadine and wait for 2 minutes and then with surgical spirit and let it dry.
- A sterile drape is placed over the area with its central opening over the aspiration site Take 5 ml of 1% lidocaine, infiltrate the skin and after few minutes infiltrate the subcutaneous

tissue and periosteum.

- After 5 minutes ensure that the periosteum is numb using the needle.
- Introduce the bone marrow aspiration needle fitted with the stylet through the skin until it reaches the periosteum .While exerting gentle pressure using boring motion, drive the needle perpendicularly into the cavity of the bone till there is sudden feeling of giveaway to the needle.
- A peculiar pain is felt by the patient as soon as the needle reaches the marrow cavity, remove the stylet and attach 10cc syringe and using minimal suction aspirate 1 to 2ml of marrow contents. Aspiration of larger amount of blood causes dilution of marrow sample by peripheral blood. If no material is aspirated, stillette is redirected and aspiration attempted again. The aspirate is diluted with liquid EDTA (marrow clots quickly)

Preparation of Marrow Films:

- Smears are made without any delay directly after the procedure.
- The diluted marrow blood with EDTA is poured over a slide kept slant for visualization of the particles.
- The particles are then taken to the corner of another side and kept on the smear making slide squash the marrow particles with gentle pressure to prevent crushing artifacts.
- Minimum of 6 smears are made, additional smears are made if special stains are required.
- Allow the sides to air dry at room temperature.
- After drying the smears are subjected to Leishman stain and Perl's stain.
- If smears cannot be made at bedside the sample should be sent to clinical pathology immediately along with duly filled and verified request forms.
- 2 finger prick smears to be taken at the time of bone marrow aspiration and sent along with the aspiration smears.

Bone Marrow Biopsy Procedure:

- Trephine biopsy is done PSIS as it gives larger and longer sample.
- The specimen is obtained by the same procedure as for aspiration but by using specially designed biopsy needle - Jamshidi reusable needles
- The needle is inserted into the bone and by using to and fro motion the needle is forwarded clockwise motion into the bone and core of the bone is obtained.
- The needle removed in anticlockwise direction. The biopsy is removed gently from the hub end of the needle by inserting the stillette through the point of the needle.
- The biopsy core is transferred into tissue paper and dabbed off any excess blood and then imprints cytology smears are taken.
- The biopsy is transferred into fixative 10 % formalin
- The biopsy is then processed as routine biopsy using histological procedures and stained with hematoxylin and eosin.

Collection of Materials for Cytodiagnosis: Accurate interpretation of cellular material is dependent on the following factors:

1. Methods of specimen collection.
2. Preservation of fluid specimens prior to processing
3. Preparation of material for microscopic examination
4. Fixation and fixatives.
5. Staining and mounting of the cell sample.

- The cells can be collected from the epithelial surfaces by lightly scraping the surface, by swabbing, aspirating or washing the surfaces.

Female genital tract (FGT):

The cytological specimens collected from FGT include cervical smear, vaginal smear, aspiration from posterior fornix of vagina (vaginal pool smear) and endometrial smear. The sample should contain a sufficient quantity of epithelial cells, and both metaplastic and columnar cells should be present. According to the Bethesda System, an adequate smear contains an adequate endocervical /

transformation zone component. Clinicians collect samples and send smears in fixative. Smears should be fixed immediately

Respiratory Tract:

Respiratory tract malignancies can be detected mainly by sputum cytology or by bronchoscopic material/ bronchoalveolar lavage fluid.

Sputum Cytology: Sputum specimen can be obtained from the patient either spontaneously or by aerosol – induced method. Morning specimen resulting from overnight accumulation of secretion yields best results. Three to five consecutive days' sputum samples should be examined to ensure maximum diagnostic accuracy. Fresh unfixed specimens are better than prefixed specimens in 70% ethyl alcohol or coating fixative such as carbowax or saccomano fixative.

Bronchoscopic Specimens: Specimens that are obtained by bronchoscopy are secretions (bronchio-alveolar lavage), direct needle aspirate from suspicious area and bronchial brushing and washings. Post-bronchoscopic sputum is one of the most valuable specimens for the detection of pulmonary lesions.

Other Sites

Oral lesions: Scrape the lesion with a tongue depressor, spread material on a clean slide and fix immediately.

Nasopharynx: Cotton tipped applicator is used to obtain material for Cytological examination. Discharge from nipple of the breast, spontaneous nipple discharge and discharge produced by breast massage are collected by applying the slide directly to the nipple followed by immediate fixation.

Fine needle aspiration cytology (FNAC):

It is useful in lesions that are easily palpable, like growth of skin, subcutaneous soft tissue tumors, thyroid, lymph nodes, salivary glands and breast.

1. Guided aspiration by internal imaging techniques like C.T or Ultrasonography allows FNA of lesions of internal organs like lung, mediastinum, abdominal and retroperitoneal organs, prostate etc.
2. The low risk of complications allows it to be performed as an out-patient procedure. It is highly suitable in debilitated patients, multiple lesions and easily repeatable.

The three pre-requisites for a meaningful diagnosis on FNAC are:

- Proper technique - procedure, preparation of smears, fixation, staining
- Microscopic evaluation of smears.
- Correlation of morphology with the clinical picture (history, clinical features, radiological and laboratory findings).

FNA can be performed as an outpatient procedure or at the patient's bedside.

Needles: Standard disposable 22-24 gauge 1-1½-inch needles are used for routine FNAC. The length and calibre of the needle should fit the size, depth, location and the consistency of the target. For small subcutaneous lesions, one-inch 23- gauge needle is ideal while for a deep-seated breast lesion, longer and larger needle is required. Finer needles are also recommended for children, and for vascular organs like thyroid.

Syringes: Standard disposable plastic syringes of 10ml are used. Syringe should be of good quality and should produce good negative pressure. 5cc syringes can be used for vascular organs like thyroid. One important factor is to check the tight fit of the needle on the syringe tip. A loosely fitting needle can render the procedure useless and may injure the patient.

Syringe holder: A syringe piston handle can be used, leaving one hand free to immobilize the lesion. This is not absolutely essential and is a matter of choice of the aspirator.

Slides: Plain glass slides of good quality are used. Slides should be clean, dry, transparent and grease free.

Fixative: 95% ethyl alcohol is recommended. Fixative is kept ready in Coplin jars.

Other supplies: Test tubes, pencil for marking, alcohol swabs for skin, Watch glass, saline, adhesive dressing, gloves etc. are needed. All the materials required are assembled in advance before starting the procedure. This is extremely important as delay in fixation can make interpretation of smears difficult.

Aspiration Procedure: Steps to be followed before performing the Aspiration

- Relevant history and clinical details, radiological findings, provisional diagnosis etc. must be entered in the requisition form. Site of FNA must be clearly stated.
- Lesion to be aspirated is palpated and its suitability for aspiration assessed.
- The appropriate needle is selected accordingly.

- The procedure must be clearly explained to the patient and consent and co-operation ensured. Patient may be anxious which needs to be allayed. Ignoring this simple but crucial step can result in failure.
- Before starting the procedure, ensure that all the required equipment, instruments and supplies are available.
- All universal precautions should be followed during the procedure.
- Steps to be followed in the actual performance of the aspiration:
- There are two fundamental methods of processing smears obtained by FNA.
- Smears are prepared and fixed according to the requirements of the stain to be used.

a. Air-drying followed by cytological stains like May – Grunwald –Giemsa (MGG), Diff Quik, Giemsa etc.: In this method, smears are intentionally air dried, but if smears are not correctly made and dried quickly artefacts will result.

b. Alcohol fixation followed by Papanicolaou (pap**)** or hematoxylin and eosin (H&E) staining: Rapid fixation in alcohol (wet fixation) is essential for pap staining, which brings out nuclear details clearly, allowing better identification of malignant cells. It also allows better comparison with histology

Imprint cytology smears:

- This is indicated in the case of tumors especially of lymph nodes. Soon after an excision biopsy of lymph node, the specimen is cut using a sharp scalpel blade. If there is blood oozing from the outer surface, touch the surface with a cotton ball soaked in normal saline.
- Then take imprint smears by touching the cut surface with a clean microslide and fix immediately.

Non-Gynaecological Cytology:

Body Fluids:

- Serous or "body cavity fluids" are usually collected with aseptic technique by needle puncture and aspiration of the body cavity fluid. Methods for obtaining the specimen vary depending upon the site.
- Fluids are best collected into a dry container and submitted in fresh state to the Laboratory

- Caution: If delay in transportation to the laboratory is unavoidable, most fluids are kept refrigerated (4ºC) up to 72 hours. A fluid sample intended for cytological analysis should never be frozen. For small fluid accumulations the entire specimen is submitted for laboratory evaluation. For larger effusions, 50-200 ml of well-mixed fluid should be sent for cytological examination.

Washings:

- Washings can be collected from various body sites. Small aliquots of balanced saline solution are washed over a directly visualized area and removed immediately with suction. These washings are usually submitted unfixed to the laboratory. If a delay is expected, they may be partially fixed in 50% ethanol equal to the volume of the specimen.

Brushings:

- Brushing specimens may be taken from any surface of the body. Direct smears, brush contents or a brush tip may all be submitted as brushing cytology.
- Direct smears**:** After the brushing is performed, the brush is rolled across the slide in an area approximately 2.5cm in diameter (the size of a quarter) to produce a thin evenly layered smear. The slide should be fixed immediately.

Cytology Samples for paraffin embedding (cell block preparation):

- Tissue samples for routine histology are fixed with 10% neutral buffered Formalin. The fixative is at least 10 times the volume of the samples and the size of the container appropriate to the specimen. Care is taken not to squash tissue.

Histopathology:

Specimen collection:

a. Small and large biopsies for H&E reporting: Specimens received from our institute and also from outside hospitals.

b. USG/CT guided biopsies.

c. Frozen section study for intraoperative rapid diagnosis.

All the specimens are collected at reception centre located in department of pathology at old hospital building. All specimens requiring routine histological diagnosis should be sent to the Laboratory in an adequately-sized, leak-proof container filled with a quantity of 10% neutral buffered Formalin, more than sufficient to cover the specimen completely (at least 10 times their volume of fixative).

Frozen Section & squash cytology:

- To cut frozen section of per operative diagnosis, rapid diagnosis, demonstration of enzymes, antigen and antibodies and fat.
- Tissues for frozen section need to be sent in normal saline not in fixatives like formalin.
- Operating surgeon should inform the pathology department half an hour before sending the specimen. Request form with details of the patient, clinical history and findings to look for e.g. margin status, lymph node status.
- Specimen will be processed and report given within 20 minutes of receiving the specimen.

DEPARTMENT OF PATHOLOGY

CLINICIAN'S HANDBOOK

(For Patients)

Prepared by: Dr. V.SIVA KUMAR (Quality Manager)

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Issue date: 1st June 2021

SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES

DIRECTORY OF SERVICES

Test Name	Specimen	Volume	Container	Transportation	Schedule	Reference range	Method	TAT	Sample retention	Charges in INR	
										OP	IP
COMPLETE HAEMOGRAM	Blood	2 ML	EDTA Bulb Lavender Top	Within 2 hrs	Daily		Automation – cell counters	3 hrs	24hrs	500	625
HAEMOGLOBIN	Blood	2 ML	EDTA Bulb Lavender Top	Within 2 hrs	Daily	0- 1mnths 16-22g/dl 2-11mnths 10-17g/dl 1-3yrs 9.5- 14.5g/dl 4- 12yrs 10-13.5g/dl Male >12yrs 14-18g/dl Female >12yrs - 12-16g/dl	Automation – cell counters	3 hrs	24hrs	50	60
HB TC DC	Blood	2 ML	EDTA Bulb Lavender Top	Within 2 hrs	Daily		Automation – cell counters	3 hrs	24hrs	250	310
HB TC DC ESR	Blood	2 ML	EDTA Bulb Lavender Top	Within 2 hrs	Daily		Automation – cell counters ESR- manual	3 hrs	24hrs	270	335
HB TC DC PLATELET COUNT	Blood	2 ML	EDTA Bulb Lavender Top	Within 2 hrs	Daily		Automation – cell counters	3 hrs	24hrs	305	380

ESR	Blood	2 ML	Black top Sodium Citrate – 3.8%/ 0.129M	Within 2 hrs	Daily	Male- 0 - 10mm at the end of 1 hr Female-0- 20 min at the end of 1 hr	Manual – Westergren's method	3 hrs	24hrs	70	90
MCH MCV	Blood	2 ML	EDTA Bulb Lavender Top	Within 2 hrs	Daily	**MCV(fl)** At birth - >12yrs 82 - 92 **MCH(pg)** At birth - >12yrs 27 - 32	Automation – cell counters	3 hrs	24hrs	60	75
PCV/HCT	Blood	2 ML	EDTA Bulb Lavender Top	Within 2 hrs	Daily	Female > 12yrs 37-42 % Males > 12yrs 40-54%	Automation – cell counters	3 hrs	24hrs	75	95
PERIPHERAL SMEAR	Blood	2 ML	EDTA Bulb Lavender Top	Within 2 hrs	Daily	Descriptive	Manual	3 hrs	24hrs	345	430
PLATELET COUNT	Blood	2 ML	EDTA Bulb Lavender Top	Within 2 hrs	Daily	Male & females > 12yrs 1.5 – 4 lakhs/cumm	Automation – cell counters	3 hrs	24hrs	100	125
RBC COUNT	Blood	2 ML	EDTA Bulb Lavender Top	Within 2 hrs	Daily			3 hrs	24hrs	90	110
WBC DIFFERENTIAL COUNT - (DC)	Blood	2 ML	EDTA Bulb Lavender Top	Within 2 hrs	Daily	Neutrophils 50-70% Eosinophils 01-02% Basophils 00-01%	Automation – cell counters	3 hrs	24hrs	70	90

						Lymphocytes 20-40% Monocytes 02-09%					
WBC (TC AND DC)	Blood	2 ML	EDTA Bulb Lavender Top	Within 2 hrs	Daily			3 hrs	24hrs	140	175
WBC TOTAL COUNT - (TC)	Blood	2 ML	EDTA Bulb Lavender Top	Within 2 hrs	Daily	4000 – 11000 cells/cumm	Automation – cell counters	3 hrs	24hrs	70	90
RETICULOCYTE COUNT	Blood	2 ML	EDTA Bulb Lavender Top	Within 2 hrs	Daily	New born 1.2- 4% Children 0.3-1% Adults 0.5 – 2.5%	Manual	3 hrs	24hrs	90	110
AEC ANC ALC	Blood	2 ML	EDTA Bulb Lavender Top	Within 2 hrs	Daily			3 hrs	24hrs	100	125
MALARIAL PARASITES(MP)(QBC METHOD) MICRO FILARIA(MF)(QBC METHOD)	Blood	2 ML	EDTA Bulb Lavender Top	Within 2 hrs	Daily	Descriptive	Manual QBC microscope	3 hrs	24hrs	175	220
SICKLE CELL TEST	Blood	2 ML	EDTA Bulb Lavender Top	Within 2 hrs	Daily	Descriptive	Manual Sickling test with 0.2% sodium metabisulphite	3 hrs	24hrs	150	190
APTT BT CT PT	Blood	1.8 ML	Blue Top Sodium Citrate	Within 2 hrs	Daily		Semi-automated	4 hrs	24hrs	500	625
APTT/PTTK	Blood	1.8 ML	Blue Top Sodium Citrate	Within 2 hrs	Daily	30- 40 sec.	Semi-automated	3 hrs	24hrs	250	310

BLEEDING TIME) AND CLOTTING TIME	Blood	1.8 ML	Blue Top Sodium Citrate	Within 2 hrs	Daily	BT – 1-6 min. CT- 6 -10minutes	Manual – IVY method Manual LEE AND WHITE	3 hrs	24hrs	100	125
PROTHROMBIN TIME WITH INR	Blood	1.8 ML	Blue Top Sodium Citrate	Within 2 hrs	Daily	PT- 11-16 seconds. INR- 1.0 to 1.5.		4 hrs	24hrs	250	310
THROMBIN TIME	Blood	1.8 ML	Blue Top Sodium Citrate	Within 2 hrs	Daily			4 hrs	24hrs	260	325
BONE MARROW ASPIRATION AND EXAMINATION	Aspirate	2ml	EDTA Bulb Lavender Top	Within 2hrs	Daily	Descriptive	Manual	3days	1week	430	540
URINE FOR ROUTINE AND MICROSCOPY	Urine	10M	Clean sterile plastic container	Within 1hr	Daily	Descriptive	Manual Strip	3hrs	24hrs	150	190
URINE FOR ALBUMIN, REACTION (PH), SPECIFIC GRAVITY, SUGAR	Urine	10M	Clean sterile plastic container	Within 1hr	Daily	Normal – nil pH - 5 - 9		3hrs	24hrs	80	100

						specific gravity – 1.010 – 1.030 sugar – nil					
URINE FOR BENZIDINE TEST, BILE PIGMENTS, BILE SALTS, CHYLE, CHYLOMICRONS, KETONE BODIES, UROBILINOZEN, MICROSCOPIC EXAMINATION	Urine	10M	Clean sterile plastic container	Within 1hr	Daily	BENZIDINE TEST- nil BILE PIGMENTS- nil BILE SALTS,-nil CHYLE- nil CHYLOMICRONS- nil KETONE BODIES- nil **Hyaline casts- 0-1** Granular cast- none Cellular Cast (RBC, WBC, etc- none Waxy cast- none **Epithelial cells-9-3** **Leukocytes (white blood cells)- 0-2** **Red blood cells- 0-2-** **Bacteria- none - few**	Manual Strip method	3hrs	24hrs	60	75

						Mucus- none – light **Crystals- none** **Spermatozoa males few** **Yeast- none** **Trichomonas- none**					
ASCITIC FLUID FOR CELL COUNT	ASCITIC FLUID	10ML	Clean sterile plastic container	Within 1hr	Daily	0-10 cells/ cumm	Manual – Improved Neubauer's chamber	3hrs	24hrs	150	190
C.S.F CELL COUNT	CSF FLUID	10ML	Clean sterile plastic container	Within 1hr	Daily	Adults: 0-1 cell/mm^3 Neonates: 0-1 cell/mm^3	Manual – Improved Neubauer chamber	3hrs	24hrs	150	190
P.D. FLUID FOR CELL COUNT	PD FLUID	10ML	Clean sterile plastic container	Within 1hr	Daily	0-10 cells/ cumm	Manual – Improved Neubauer's chamber	3hrs	24hrs	150	190
PERICARDIAL FLUID FOR CELL COUNT	PERICARDIAL FLUID	10ML	Clean sterile plastic container	Within 1hr	Daily	0-10 cells/ cumm	Manual – Improved Neubauer's chamber	3hrs	24hrs	150	190
PERITONIAL FLUID FOR CELL COUNT	PERITONEAL FLUID	10ML	Clean sterile plastic container	Within 1hr	Daily	0-10 cells/ cumm	Manual – Improved Neubauer, 's chamber	3hrs	24hrs	150	190
PLEURAL FLUID FOR CELL COUNT	PLEURAL FLUID	10ML	Clean sterile plastic container	Within 1hr	Daily	0-10 cells/ cumm	Manual – Improved Neubauer chamber	3hrs	24hrs	150	190

ANY OTHER BODY FLUID FOR CELL COUNT	OTHER BODY FLUID	10ML	Clean sterile plastic container	Within 1hr	Daily	0-10 cells/ cumm	Manual – Improved Neubauer's chamber	3hrs	24hrs	150	190
SYNOVIAL FLUID FOR CELL COUNT	SYNOVIAL FLUID	10ML	Clean sterile plastic container	Within 1hr	Daily	0-10 cells/ cumm	Manual – Improved Neubauer's chamber	3hrs	24hrs	150	190
SEMEN ANALYSIS	SEMEN		Clean sterile plastic container	Within 1hr	Daily	≥ 20 million/ml ≥30% sperms with normal morphology ≥75% live	Manual – Improved Neubauer's chamber	3hrs	24hrs	500	625
URINE FOR EOSINOPHILS(EARLY MORNIG SAMPLE)	URINE (EARLY MORNING SAMPLE)	10ML	Clean sterile plastic container	Within 1hr	Daily	0-2	Manual	3hrs	24hrs	150	190
STOOL-OCCULT BLOOD	STOOL	2ML	Clean sterile plastic container	Within 1hr	Daily	Descriptive	Manual	3hrs	24hrs	100	125
FNAC BONE, BREAST, CT/GUIDED, FEMALE GENITAL ORGANS, HEAD AND NECK, SALIVARY GLANDS, KIDNEY AND ADRENAL AND	ASPIRATE	-	Clean container with isopropyl alcohol	Within 1hr	Daily	Descriptive	Manual	24hrs	48hrs	500	625

RETROPERITONEUM, LIVER AND SPLEEN, LUNG, CHEST WALL AND PLEURA, LYMPHNODE, MALE GENITAL ORGANS, MEDIA STINUM, PANCREAS AND BILITARY TRACT AND GIT TRACT, SKIN, SOFT TISSUE, THYROID, U/S GUIDED											
FLUID CYTOLOGY ASCITIC FLUID, ASCITIC FLUID, BRONCHIAL WASHING LAVAGE, CSF, CYSTIC FLUID, PERICARDIAL FLUID, PLEURAL FLUID, PUS, SPUTUM, SYNOVIAL FLUID, URINE	FLUID	3ML	Clean sterile container	Daily	Within 1hr	Descriptive	Manual	24hrs	48hrs	350	440
NIPPLE DISCHARGE	TOUCH/ SMEARS		MINIMUM 2SMEAS	Daily	Within 1hr	Descriptive	Manual	24hrs		140	175
PAP SMEARS	Cytofixative tube		Containers with cytofixative	Daily	Within 1hr	Descriptive	Manual	24hrs		275	340

	with brush Alcohol fixed smears on glass slides (Minimum 2 No.s)		Used Uristix container with isopropyl alcohol								
BUCCAL SMEARS FOR SEX CHROMATIN	Alcohol fixed smears on glass slides (Minimum 2 No.s)		Used Uristix container with isopropyl alcohol	Daily	Within 1hr	Descriptive	Manual	24hrs		140	175
SECOND OPINION(REVIEW OPINION) CYTOLOGY	STAINED SMEARS					Descriptive	Manual	24hrs		500	625
BIOPSY (1 BLOCK), CT GUIDED (1BLOCK), U/S	TISSUE		Appropriate size leak proof	Daily	Within 1hr	Descriptive	Semi-automated tissue	3days	1month	250	310

GUIDED			plastic container with 10% Neutral buffered formalin (10-20 times volume of sample)				processor and manual				
BIOPSY (2 - 5 BLOCK)	TISSUE		Appropriate size leak proof plastic container with 10% Neutral buffered formalin (10-20 times volume of sample)	Daily	Within 1hr	Descriptive	Semi-automated tissue processor and manual	3days	1month	450	560
BIOPSY (6 - 10 BLOCKS)	TISSUE		Appropriate size leak proof plastic container with 10% Neutral buffered formalin	Daily	Within 1hr		Semi - automated tissue processor and manual	7days	1month	600	750

			(10-20 times volume of sample)								
BIOPSY (MORE THAN 10 BLOCKS)	TISSUE		Appropriate size leak proof plastic container with 10% Neutral buffered formalin (10-20 times volume of sample)	Daily	Within 1hr	Descriptive	Semi-automated tissue processor and manual	7days	1month	800	1000
BIOPSY (MORE THAN 20 BLOCKS)	TISSUE		Appropriate size leak proof plastic container with 10% Neutral buffered formalin (10-20 times volume of sample)	Daily	Within 1hr	Descriptive	Semi-automated tissue processor and manual	7days	1month	1000	1250

BIOPSY (MORE THAN 30 BLOCKS)	TISSUE		Appropriate size leak proof plastic container with 10% Neutral buffered formalin (10-20 times volume of sample)	Daily	Within 1hr	Descriptive	Semi-automated tissue processor and manual	7days	1month	1500	1875
BIOPSY (MORE THAN 40 BLOCKS)	TISSUE		Appropriate size leak proof plastic container with 10% Neutral buffered formalin (10-20 times volume of sample)	Daily	Within 1hr	Descriptive	Semi-automated tissue processor and manual	7days	1month	2000	2500
ENDOSCOPIC BITS, LIVER BIOPSY, LYMPHNODE BIOPSY, KIDNEY WITHOUT IF PACKAGE	TISSUE		Appropriate size leak proof plastic container with 10%	Daily	Within 1hr	Descriptive	Semi-automated tissue processor and manual	3days	1month	500	625

			Neutral buffered formalin (10-20 times volume of sample)								
TRUS BIOPSY (2 -6 BLOCKS)	TISSUE		Appropriate size leak proof plastic container with 10% Neutral buffered formalin (10-20 times volume of sample)	Daily	Within 1hr	Descriptive	Semi-automated tissue processor and manual	3days	1month	600	750
TREPHINE BIOPSY (BONE MARROW)	BONE		Appropriate size leak proof plastic container with 10% Neutral buffered formalin (10-20 times volume of sample)	Daily	Within 1hr	Descriptive	Semi-automated tissue processor and manual	7days	1month	650	810

CROSTAT SECTION AND SQUASH	TISSUE		Appropriate size leak proof plastic container	Daily		Descriptive	Cryostat and manual	30mis		1000	1250
FOETAL AUTOPSY FOR DIAGNOSIS	FETUS		Appropriate size leak proof plastic container with 10% Neutral buffered formalin (10-20 times volume of sample)	Daily	Within 1hr	Descriptive	Semi-automated tissue processor and manual	7days	1month	1500	1875
IMMUNOHISTOCHEMISTRY (IHC) , IMMUNOCYTOCHEMISTRY (ICC)	PARAFFIN BLOCKS			Daily		Descriptive	Manual	7days		750	940
IHC (2-5 MARKERS)	PARAFFIN BLOCKS			Daily				7days		3750	4690
IHC (6-10 MARKERS)	PARAFFIN			Daily				7days		7500	9375

	BLOCKS										
IHC (11-15 MARKERS)	PARAFFIN BLOCKS			Daily				7days		11250	14065
IHC (2-5 MARKERS PANEL)	PARAFFIN BLOCKS			Daily				7days		3000	3750
IHC (6-10 MARKERS PANEL)	PARAFFIN BLOCKS			Daily				7days		5000	6250
IHC (11-15 MARKERS PANEL)	PARAFFIN BLOCKS			Daily				7days		9000	11250
IHC PACKAGE FOR CNS TUMOURS	PARAFFIN BLOCKS			Daily				7days		2500	3125
KIDNEY BIOPSY (WITH IF) PACKAGE	KIDNEY BIOPSY		• One piece in 10% Neutral buffered	Daily		Descriptive	Manual and Immunofluorescence-nce microscope	7days		2500	3125

			formalin (10-20 times volume of sample) • One piece in normal saline If EM studies required an additional bit to be sent in gluteraldehyde (2.5%)								
SECOND OPINION (REVIEW BIOPSY)	PARAFFIN BLOCKS AND SLIDES			Daily				3days		500	625
PARAFFIN BLOCK (EACH)	PARAFFIN BLOCKS			Daily				2days		50	60

DUPLICATE SLIDES (EACH)	H&E STAINED SLIDES			Daily				2days		150	190
HAEMOGLOBIN (STAT TESTING)	Blood	2 ML	EDTA Bulb Lavender Top	Within 1hr	Daily	0- 1mnths 16-22g/dl 2-11mnths 10-17g/dl 1-3yrs 9.5- 14.5g/dl 4- 12yrs 10-13.5g/dl Male >12yrs 14-18g/dl Female >12yrs - 12-16g/dl	Automation – cell counters	1hr	24hrs	65	65
MALARIAL PARASITES-(MP) (QBC METHOD) (STAT TESTING)	Blood	2 ML	EDTA Bulb Lavender Top	Within 1 hr	Daily	Descriptive	Manual QBC microscope	1hr	24hrs	230	230
PCV (STAT TESTING)	Blood	2 ML	EDTA Bulb Lavender Top	Within 1 hr	Daily	Female > 12yrs 37-42 % Males > 12yrs 40-54%	Automation – cell counters	1hr	24hrs	100	100
PLATELET COUNT (STAT TESTING)	Blood	2 ML	EDTA Bulb Lavender Top	Within 1 hr	Daily	Male & females > 12yrs 1.5 – 4 lakhs/cumm	Automation – cell counters	1 hr	24hrs	130	130
APTT/PTTK (STAT TESTING),	Blood	1.8ML	Blue Top Sodium	Within 1hr	Daily	APTT- 30- 40 sec.	Semi-automated	1hr	24hrs	325	325

PROTHROMBIN TIME WITH INR (STAT TESTING)			Citrate – 3.2%/ 0.109M			PT- 11-16 sec. INR- 1.0 to 1.					
C.S.F. CELL COUNT (STAT TESTING)	CSF	2ML	Clean sterile plastic container	Within 1hr	Daily	Adults: 0-1 cell/mm^3 Neonates: 0-1 cell/mm^3	Manual – Improved Neubauer's chamber	1hr	24hrs	195	195
URINE FOR KETONE BODIES (STAT TESTNG)	URINE	10ML	Clean sterile plastic container	Within 1hr	Daily	ketone bodies – nil	manual strip method	1hr	24hrs	80	80